

BIOTIC COMMUNITY

Fish Community

Historical records of fish community collections within the South Grand Watershed date back to 6 July, 1940 (MDC 1998a and MoRAP 2002a). From 1940 to 2002, 60 fish species (not including hybrids) in 15 families have been collected within the watershed (Table Bc01) (MNHP 2003; MDC South Grand Watershed Inventory and Assessment Fish Community Collections; MoRAP 2002a; MDC 1998a; Pflieger 1997; Dent and Macpherson, MDC Memorandum 1985; Dent, MDC Memorandum 1981). Fish community sampling sites are presented in Figure Bc01.

Analysis of temporal distribution of species within the watershed was accomplished by dividing the examined period of record for fish community collections into three periods: Period One (1940-1959), Period Two (1960-1979), and Period Three (1980-2002). This analysis revealed that the number of species within the watershed between periods 1 and 2 remained similar with 43 and 42 species collected respectively. Period Three saw an increase in the number of species collected within the watershed at 48. Six species found within the watershed in Period 3 had not been found in previous periods. These species include Quillback (*Carpiodes cyprinus*), Golden Redhorse (*Moxostoma erythrurum*), Warmouth (*Lepomis gulosus*), Shortnose Gar (*Lepisosteus platostomus*), White Bass (*Morone chrysops*), Ohio Logperch (*Percina caprodes*).

Twelve fish species found within the watershed in periods one and/or two were not found in period three. These include Black Buffalo (*Ictiobus niger*), Longear Sunfish (*Lepomis megalotis*), Goldfish (*Carassius auratus*), Bleeding Shiner (*Luxilus zonatus*), Silver Chub (*Macrhybopsis storeriana*), Hornyhead Chub (*Nocomis biguttatus*), Emerald Shiner (*Notropis atherinoides*), Ghost Shiner (*Notropis Buchanan*), Goldeye (*Hiodon alosoides*), Tadpole Madtom (*Noturus gyrinus*), Freckled Madtom (*Noturus nocturnes*), and Longnose Gar (*Lepisosteus osseus*). Four species, including the goldfish, bleeding Shiner, black buffalo, and tadpole madtom, do not appear to have solid records of being common to the watershed. This is illustrated by the fact that only one individual for all four species is recorded as having been found in the watershed. In addition, each species was found only at a single site within the watershed with no additional individuals observed after Period One. Several other species not seen since Period One include the Goldeye (found at a single site), Longnose Gar (only three individuals recorded at 3 sites, one of which is now part of Truman reservoir), Longear Sunfish (four individuals found at two sites, one of which is now part of Truman Reservoir), Silver Chub (11 individuals found at 3 sites, two of which are now part of Truman Reservoir), and Ghost Shiner (14 individuals found at 3 sites, two of which are now part of Truman Reservoir). Another species, the freckled madtom is only recorded within the watershed in period two. Five individuals were found at a single site in 1976. This site has since become part of Truman Reservoir.

Two species which appear to have been relatively well established within the watershed during Periods One and Two are absent from Period Three collections. The hornyhead chub was previously reported from 4 sites (including one site which is now part of Truman Reservoir) within the watershed with 24 individuals recorded. Over 200 individuals of the emerald shiner were also reported during Periods One and Two from 5 sites, three of which are now part of Truman Reservoir.

The exact cause or causes of the appearance of some species and apparent disappearance of others in the watershed is difficult to ascertain given the many different variables one might need to take into account among these of which are differences in sampling effort and gear between the three time periods. Such an analysis not only goes beyond the scope of this document but could comprise a fairly lengthy report by itself. It is apparent however that changes have taken place within the watershed that could be beneficial to the appearance of some species while being detrimental to others. These changes include the creation of Truman Reservoir, and the lingering effects of channelization within the watershed. Future fish community sampling will be an important component in determining the effect and/or potential effect of watershed changes on the fish species residing there.

Game Fish

A total of 13 species of gamefish (as defined as game fish in MDC 2001c) are known to occur within the watershed (MDC 2003d, MoRAP 2002a; MDC 1998a; Dent and McPherson 1985). These include spotted bass, largemouth bass, white crappie, black crappie, blue catfish, channel catfish, flathead catfish, white bass, striped bass, walleye, and paddlefish. Muskellunge and warmouth have been observed in the watershed however, these are not considered to be significant fisheries. Flathead, blue, and channel catfish make up the primary game fishery of the South Grand River and its tributaries, while rough fish such as common carp, buffalo, and drum provide fisheries for alternative angling opportunities. (Bayless, personal communication) The lower portion of the South Grand supports a significant population of crappie. Spring rises also provide angling opportunities for hybrid striped bass and white bass. In addition, a limited amount of angling for paddlefish also occurs.

Truman Reservoir, located in the lower portion of the watershed, provides a diverse array of game fish. Significant game fish populations include black bass, crappie, white bass, hybrid striped bass, walleye, paddlefish, blue catfish, channel catfish, and flathead catfish. Since the early years of the existence of Truman Reservoir, paddlefish, and hybrid striped bass have been stocked nearly every year (MDC 2003b, MDC 1985-1990, Dent and McPherson 1985). In addition, recent walleye stockings in 2001 and 2002 have supplemented the existing walleye fishery within the reservoir.

Fish Introductions

Limited availability of historic stocking records, the potential of “bait bucket” introductions and the availability of fish from commercial dealers, makes it difficult to address the entire scope of fish stocking which has or may have occurred in the South Grand Watershed. However, examination of various sources reveals some past stocking efforts.

Historic fish stocking efforts within the South Grand Watershed appear to have been limited to the stocking of warm water species. The common carp, a species native to Asia, was widely stocked in Missouri by the Missouri Fish Commission between 1879 and 1895 at which time the program was discontinued (Pflieger 1997). Earliest observations of common carp from MDC fish community collection files for sites within the watershed are from 1940 (MoRAP 2002a). While common carp are a component of the commercial fishing industry in Missouri (Barnes and Riggert 2000), common carp can also be a nuisance species. They compete in rivers, streams, and lakes with native species. They can increase stream and lake turbidity, destroy spawning habitat, while eating the eggs of native species of fish (Barnes and Riggert 2000).

As with the common carp, the western mosquitofish is another species whose presence in the watershed is

likely the result of stocking. A survey in the 1940s indicated that its distribution in Missouri included the “Lowland Faunal Region and northward along the Mississippi River to Ramsey Creek in Pike County” (Pflieger 1997). Today the mosquito fish can be found in all of the faunal regions of the state. The first observations of the western mosquitofish in fish collections within the watershed appear to have occurred in 1976.

Some Early MDC Annual Reports list largemouth bass, crappie, bluegill, green sunfish, “bullheads” (catfish), and minnows for the South Grand in tables under the heading “Fisheries Production and Distribution by Watersheds by Species” (MDC 1937-1942 and 1946-1992). In addition some MDC annual reports provide a general (not by watershed) tabulation of fish “rescued” (removing fish from intermittent pools of water and redistributing to areas deemed more suitable) by the MDC; a practice which has been discontinued. This data, while somewhat vague provides a glimpse of some early stocking and relocating of fish that occurred earlier in the last century and which may have had an impact on the fish community of the South Grand Watershed.

Records of recent stockings within public waters of the South Grand watershed by the MDC are well documented. Between 1991 and 2001, 14 species of fish have been stocked by the Missouri Department of Conservation in public impoundments within the South Grand Watershed (MDC 2003b). The majority of stockings have been warm water species with the exception of rainbow and brown trout which have been stocked on a limited basis in a single impoundment at MDC’s Reed Wildlife Area during the winter and early spring. Fathead minnows, commonly stocked as forage for various sport fish species, accounted for the largest number of a single species of fish stocked in public waters within the watershed with 2,224,500 fish stocked. The stocking of 1,222,047 paddlefish in Truman Reservoir accounted for the largest number of game fish of a single species stocked. Table Bc02 lists other species which were stocked in public waters within the watershed between 1991 and 2001.

Since 1978, a large amount of stocking which has occurred in the watershed has been in Truman Reservoir. Since the early years of the existence of Truman Reservoir, paddlefish and hybrid striped bass have been stocked on nearly every year, with paddlefish first being stocked in Truman in 1978 and the initial stockings of hybrid striped bass taking place in 1982 (MDC 2003b, MDC 1985-1990, Dent and McPherson 1985). Yearly stockings of striped bass were initiated in 1977, but were discontinued in 1980, two years prior to the first hybrid stockings. Walleye were initially stocked in Truman from 1980 to 1986 after which time the stockings were discontinued until 1993 when stocking took place for that single year. Walleye stocking was reinitiated once again in 2001. Other species (and years) stocked within Truman Reservoir since it’s creation include Blue Catfish (1979, 1983, 1991, 1994-1996), channel catfish (1978), threadfin shad (1980, 1981, 1983), largemouth bass (1977-1979, 1989), muskellunge (1978), and fathead minnow (1986).

The extent to which fish stocking of private waters has occurred within the watershed is more difficult to determine than public waters. Undoubtedly, farm ponds within the watershed have been stocked with largemouth bass, bluegill, and channel catfish by private individuals who obtained fish from the MDC, commercial dealers, and/or other water bodies. The availability of grass carp from commercial fish dealers also increases the probability of this species having been stocked in water bodies within the watershed. The potential of these fish being washed into streams exists during major precipitation events.

A lack of historical records, plus the occurrence of undocumented introductions makes it difficult to determine, with any reliability, all species which may have been introduced into the watershed. Effects

of introductions vary. While the introduction of species already present in the watershed may have minimal to no effect, the introduction of exotic (non-native) species can, in many instances, have disastrous consequences.

Mussels

It appears that no recent data regarding mussels in the South Grand Watershed is available. The Missouri Aquatic Gap Database (MoRAP 2002b) lists records for 7 collections within the watershed, the latest of which occurred in 1978. From these collections, a total of 15 species were identified (Table Bc03 and Figure Bc02). Eight species were found only at sites which are currently located within the flood control pool boundary of Truman Reservoir. These species include the mapleleaf, mucket, pimpleback, pink heelsplitter, pistolgrip, pondhorn, threeridge, and washboard. Without contemporary data regarding mussel distribution within the South Grand Watershed, it is left to speculation as to the fate of these species as well as species distribution elsewhere within the watershed. Future mussel sampling will be necessary in order to determine the current status of the mussel community within the South Grand Watershed.

Snails

Nine species of snails have been identified within the South Grand Watershed (Wu et al. 1997 and MoRAP 2002c). These include Ash Gyro (*Gyraulus parvu*), Fragile Ancyloid (*Ferrisia fragilis*), Duck Physa (*Physa [Physodon] anatine*), Glossy Physa (*Physa [Physodon] pomilia*), Hale's Physa (*Physa [Physodon] halei*), Lateritic Physa (*Physella acuta*), Marsh Ramshorn (*Helisoma trivolvis*), Mimic Lymnaea (*Pseudosuccinea columella*), Sampson sprite (*Menetus sampsoni*) (Wu et al. 1997 and MoRAP 2002c). Figure Bc02 displays snail collection sites within the watershed in Missouri.

Crayfish

Only two crayfish species are known to occur within the South Grand Watershed. These are the grassland crayfish (*Procambarus gracilis*) and northern crayfish (*Orconectes virilis*) (Pflieger 1996 and MoRAP 2002d). The northern crayfish is fairly widespread throughout Missouri with the exception of the Central Ozarks where it appears to currently occur only in scattered pockets which may be the result of bait-bucket introductions (Pflieger 1996). The grassland crayfish is less widely distributed in Missouri than the Northern. It primarily occurs in the prairie region of the state with the exception of some locales along the western fringe of the Missouri Ozarks (Pflieger 1996). Figure Bc02 displays crayfish collection sites within the watershed in Missouri.

Benthic Invertebrates

One hundred and eighty three taxa of aquatic invertebrates have been collected within the South Grand Watershed since 1975 (MDC 1998c) (Table Bc04). Figure Bc02 displays benthic invertebrate collection sites within the watershed in Missouri.

Species of Conservation Concern

Within the South Grand Watershed, 22 species of conservation concern have been identified (Table Bc05) (MNHP 2003). These include 10 species of plants (flowering plants, ferns, fern allies, and mosses); 1 species of insect; 1 species of amphibian, and 10 species of birds. Three species within the watershed are federally listed as threatened. These include the Mead's milkweed, geocarpon, and bald

eagle. The aforementioned species are also state listed as endangered. An additional 3 species are also state listed as endangered. These are the northern harrier, greater prairie-chicken, and barn owl.

Records that were not included in this analysis include Missouri Natural Heritage Program (MNHP) records of occurrences listed as historic, destroyed, or introduced (exotic). It is also important to note that the status of the above mentioned species are based on the status provided in the MNHP database at the time of this writing and may be subject to change.

